

IN THE CLAIMS:

Please cancel Claims 31-36 without prejudice to presenting in a further application.

1. (Original) A process for deacidifying not from concentrate (NFC) citrus juice using an ion-exchange column having a lower volume portion filled with acid-adsorbing resin beads and having an upper volume portion within which the resin beads are not present, the lower volume portion having an exit port, a first inlet port opening into the upper volume portion at an upper location spaced a given distance above the resin beads, a second inlet port opening into the upper volume portion at a lower location which is spaced a distance above the resin beads which is less than said given distance, the process comprising:

introducing water into the resin column;

draining a fraction of the water from the column through the exit port to create a head space in the column above the resin beads, the resin beads remaining submerged under the water;

introducing untreated citrus juice having a pre-determined brix and acidity into the resin column through the second inlet port and into the head space;

introducing untreated citrus juice into the resin column through the first inlet port;

draining water through the exit port until the brix of the outflowing treated liquid exceeds a pre-determined minimum value relative to the brix of the untreated citrus juice;

continuing to introduce untreated citrus juice through the first inlet port and directing treated liquid to production of deacidified NFC citrus juice until such time as the acidity of the treated liquid exceeds a pre-determined value;

removing treated citrus juice from the resin column so as to create a head space in the column while the resin beads remain submerged;

introducing water through the second inlet port and into the head space in the column;

introducing water through the first inlet port; and

passing liquid through the exit port until the brix of the outflowing liquid drops below a pre-determined value, at which time treated liquid is no longer directed to production.

2. (Original) The process of claim 1 wherein the untreated citrus juice is introduced into the resin column through the second inlet port until the head space is filled with untreated citrus juice.

3. (Original) The process of claim 1 wherein the untreated citrus juice is introduced into the resin column through the first inlet port simultaneously with the draining of the water through the exit port.

4. (Original) The process of claim 1 wherein the outflowing liquid is first directed to production of deacidified NFC citrus juice when the brix of the liquid flowing through the exit port exceeds the pre-determined minimum value relative to the brix of the untreated citrus juice.

5. (Original) The process of claim 1 wherein the water is introduced into the resin column through the second inlet port until the head space in the column is filled.

6. (Original) The process of claim 1 wherein the water is introduced through the first inlet port simultaneously with the passing of liquid through the exit port.

7. (Original) The process of claim 1 further comprising recovering the treated liquid of the draining procedure for further processing into non-NFC juice products.

8. (Original) The process of claim 1 further comprising recovering the treated liquid from the passing procedure for further processing into non-NFC juice products.

9. (Original) The process of claim 1 wherein the treated liquid is diverted to production so long as the brix of the treated liquid exceeds approximately 90 percent of the brix of the untreated juice.

10. (Original) The process of claim 7 wherein the treated liquid is recovered for further processing when the brix of the

treated liquid is less than approximately 90 percent of the brix of the untreated juice.

11. (Original) The process of claim 8 wherein the treated liquid is recovered for further processing when the brix of the treated liquid is less than approximately 90 percent of the brix of the untreated juice.

12. (Original) A process for deacidifying not from concentrate (NFC) citrus juice using an ion-exchange column having a lower volume portion filled with acid-adsorbing resin beads and having an upper volume portion within which the resin beads are not present, the lower volume portion having an exit port, the process comprising:

introducing water into the resin column;

draining a fraction of the water from the column through the exit port to create a head space in the column above the resin beads, the resin beads remaining submerged under the water;

introducing untreated citrus juice having a pre-determined brix and acidity into the resin column into the head space;

draining water through the exit port until the brix of the outflowing treated liquid exceeds a pre-determined minimum value relative to the brix of the untreated citrus juice;

continuing to introduce untreated citrus juice and directing treated liquid to production of deacidified NFC citrus juice until such time as the acidity of the treated liquid exceeds a pre-determined value;

removing treated citrus juice from the resin column so as to create a head space in the column while the resin beads remain submerged;

introducing water into the head space in the column; and

passing liquid through the exit port until the brix of the outflowing liquid drops below a pre-determined value, at which time treated liquid is no longer directed to production.

13. (Original) The process of claim 12 wherein the untreated citrus juice is introduced into the resin column until the head space is filled with untreated citrus juice.

14. (Original) The process of claim 12 wherein the untreated citrus juice is introduced into the resin column simultaneously with the draining of the water through the exit port.

15. (Original) The process of claim 12 wherein the outflowing liquid is first directed to production of deacidified NFC citrus juice when the brix of the liquid flowing through the exit port exceeds the pre-determined minimum value relative to the brix of the untreated citrus juice.

16. (Original) The process of claim 12 wherein the water is introduced into the resin column until the head space in the column is filled.

17. (Original) The process of claim 12 wherein the water is introduced into the column simultaneously with the passing of liquid through the exit port.

18. (Original) The process of claim 12 further comprising recovering the treated liquids of the draining procedure for further processing into non-NFC juice products.

19. (Original) The process of claim 12 further comprising recovering the treated liquid from the passing procedure for further processing into non-NFC juice products.

20. (Original) The process of claim 12 wherein the treated liquid is diverted to production so long as the brix of the treated liquid exceeds approximately 90 percent of the brix of the untreated juice.

21. (Original) The process of claim 18 wherein the treated liquid is recovered for further processing when the brix of the treated liquid is less than approximately 90 percent of the brix of the untreated juice.

22. (Original) The process of claim 19 wherein the treated liquid is recovered for further processing when the brix of the treated liquid is less than approximately 90 percent of the brix of the untreated juice.

23. (Original) A process for making a low-acid not from concentrate citrus juice product comprising:

providing an initial citrus juice flow having sinking solids and a known brix;

diverting from the initial citrus juice flow a first portion of the citrus juice from a second portion of the citrus juice;

separating out the sinking solids from the first portion of the citrus juice to provide a solids-reduced citrus juice having not greater than about 2 volume percent sinking solids based upon the total volume of the solids-reduced citrus juice;

providing an ion-exchange column having a lower volume portion filled with acid-adsorbing resin beads and having an upper volume portion within which the resin beads are not present, the lower volume portion having an exit port, a first inlet port opening into the upper volume portion at an upper

location spaced a given distance above the resin beads, and a second inlet port opening into the upper volume portion at a lower location which is spaced a distance above the resin beads which is less than said given distance;

introducing water into the resin column;

draining a fraction of the water from the column through the exit port to create a head space in the column above the resin beads, the resin beads remaining submerged under the water;

introducing the solids-reduced citrus juice into the resin column through the second inlet port and into the head space;

introducing the solids-reduced citrus juice into the resin column through the first inlet port;

draining water through the exit port until the brix of the outflowing treated liquid exceeds a pre-determined minimum value relative to the brix of the initial citrus juice flow;

continuing to introduce solids-reduced citrus juice through the first inlet port and directing treated liquid to production of deacidified NFC citrus juice until such time as the acidity of the treated liquid exceeds a pre-determined value;

removing treated citrus juice from the resin column so as to create a head space in the column while the resin beads remain submerged;



introducing water through the second inlet port and into the head space in the column;

introducing water through the first inlet port;

passing liquid through the exit port until the brix of the outflowing liquid drops below a pre-determined value, at which time treated liquid is no longer directed to production;

combining the deacidified NFC citrus juice from the ion-exchange column with said second portion of the citrus juice flow and with the separated sinking solids to achieve a final blend, which is a low-acid not from concentrate citrus juice.

24. (Original) The process of claim 23 further comprising adding a portion of the initial citrus juice flow to the deacidified citrus juice immediately after deacidification to lower the pH of the deacidified citrus juice to a value that discourages microbial activity.

25. (Original) The process of claim 23 further comprising cooling the initial citrus juice flow to a temperature of not greater than about 45°F and maintaining the citrus juice at or below this temperature throughout the process, except during pasteurization, if same is practiced during the process.

26. (Original) The process of claim 23 wherein the separating procedure reduces the sinking solids in the solids-reduced citrus juice to less than about one volume percent, based on the total volume of the solids-reduced citrus juice.

27. (Original) A process for making a low-acid not from concentrate citrus juice product comprising:

providing an initial citrus juice flow having sinking solids and a known brix;

diverting from the initial citrus juice flow a first portion of the citrus juice from a second portion of the citrus juice;

separating out the sinking solids from the first portion of the citrus juice to provide a solids-reduced citrus juice having not greater than about 2 volume percent sinking solids based upon the total volume of the solids-reduced citrus juice;

providing an ion-exchange column having a lower volume portion filled with acid-adsorbing resin beads and having an upper volume portion within which the resin beads are not present, the lower volume portion having an exit port;

introducing water into the resin column;

draining a fraction of the water from the column through the exit port to create a head space in the column above the resin beads, the resin beads remaining submerged under the water;

introducing the solids-reduced citrus juice into the resin column into the head space;

draining water through the exit port until the brix of the outflowing treated liquid exceeds a pre-determined minimum value relative to the brix of the initial citrus juice flow;

continuing to introduce solids-reduced citrus juice and directing treated liquid to production of deacidified NFC citrus juice until such time as the acidity of the treated liquid exceeds a pre-determined value;

removing treated citrus juice from the resin column so as to create a head space in the column while the resin beads remain submerged;

introducing water into the head space in the column;

passing liquid through the exit port until the brix of the outflowing liquid drops below a pre-determined value, at which time treated liquid is no longer directed to production;

combining the deacidified NFC citrus juice from the ion-exchange column with said second portion of the citrus juice flow and with the separated sinking solids to achieve a final blend, which is a low-acid not from concentrate citrus juice.

28. (Original) The process of claim 27 further comprising adding a portion of the initial citrus juice flow to the deacidified citrus juice immediately after deacidification to lower the pH of the deacidified citrus juice to a value that discourages microbial activity.

29. (Original) The process of claim 27 further comprising cooling the initial citrus juice flow to a temperature of not greater than about 45° F and maintaining the citrus juice at or below this temperature throughout the process, except during pasteurization, if same is practiced during the process.

30. (Original) The process of claim 27 wherein the separating procedure reduces the sinking solids in the solids-reduced citrus juice to less than about one volume percent, based on the total volume of the solids-reduced citrus juice.